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The Labiatae of Iowa

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THE LABIATAE OF IOWA

LOUIS NELSON BASS

INTRODUCTION

This paper is the outcome of a careful study of the specimens of Labiatae in the herbarium of the State University of Iowa.

The aim of this study is to provide a workable key to the genera and species, records of distribution and up-to-date nomenclature for the Labiatae of Iowa.

Fifty-nine species included in twenty-two genera are recorded for Iowa in the collection. Of the fifty-nine species studied fourteen are rare, ten infrequent, sixteen frequent and nineteen common. Detailed descriptions have been omitted except for the rare species and those which are not sufficiently described in the key for easy recognition. Forty-six of the recorded species are native while only thirteen are introduced. The source of each of the latter is noted in the text.

Gray's Manual, seventh edition, has been followed for the sequence of genera. Since publication of this manual some of the specific names used therein have been invalidated by revisions of the rules of nomenclature and by changes in taxonomic concepts. The names thus rendered invalid are given as synonyms with no attempt at complete synonymy.

While collecting in the vicinity of Iowa City the writer found a species of *Leonurus* apparently unreported for the state. This new record is *Leonurus marrubiastrum*, reported in the United States as growing only along the east coast. This species was collected in October, 1942, along a ditch running through sparsely wooded lowlands along the Iowa river, approximately 1.5 miles south of Iowa City. The specimens were checked with the description for this species given in Hegi's "Flora von Mittel-Europa," and Bonnier's "Flore Complete de France, Suisse et Belgique," and were found to coincide closely. The identification was checked by Dr. W. A. Anderson.

The collection studied included the following species not listed in Cratty's "Iowa Flora": *Teucrium occidentale* var. *boreale*, *Scutellaria nervosa*, *Scutellaria incana*, *Physostegia virginiana*, *Stachys arenicola*, *Salvia azurea* var. *grandiflora*, *Monarda fistulosa*, *Blephilia ciliata*, *Hyssopus officinalis*, *Mentha citrata* and *Mentha aquatica*.

Stachys pustulata Rydb. listed in Cratty's "Iowa Flora" as infrequent is not represented in the collection studied. Doubtless other species not represented in this collection occur in Iowa.

A study of the distribution shows several interesting patterns:

1. These species are common throughout the state: *Scutellaria parvula*, *Scutellaria lateriflora*, *Agastache scrophulariaefolia*, *Prunella vulgaris*, *Stachys palustris*, *Monarda mollis*, *Hedeoma hispida*, *Pycnanthemum flexuosum* and *Lycopus americanus*.

2. The following are recorded as found only in the eastern third of the state: *Scutellaria ovata*, *Monarda fistulosa*, *Monarda punctata* and *Blephilia hirsuta*.

3. Found mostly in the eastern and southeastern parts of the state, but also in a few scattered counties of the western half of the state are: *Pycnanthemum pilosum*, *Hedeoma pulegioides*, *Stachys tenuifolia*, *Leonurus cardiaca*, *Glechoma hederacea*, *Isanthus brachiatus* and *Teucrium canadense*.

4. Found mostly in the northern and eastern parts of the state, rare in the rest of the state are: *Scutellaria galericulata*, *Physostegia parviflora*, *Stachys palustris* var. *homotricha*, *pycnanthemum virginianum*, *Lycopus virginicus* and *Mentha arvensis* var. *canadensis*.

5. Found mostly in the southwestern part of the state, also in scattered counties throughout the rest of the state is *Salvia lanceolata*.

The other species have varied distributions, some being recorded as found in only one or two counties and others in several widely separated counties.

Although this paper deals primarily with plants growing in the wild state it may be of interest to note a few genera which are commonly found in cultivation: *Ajuga*, *Coleus*, *Hyssopus*, *Lamium*, *Lavandula*, *Mentha*, *Monarda*, *Nepeta*, *Physostegia*, *Prunella*, *Salvia*, *Satureja*, *Teucrium* and *Thymus*.

The characteristics of the mint family are so well known that a description of the family is unnecessary for this paper.

KEY TO THE GENERA

- A. Ovary of four obliquely or ventrally attached, united nutlets which are rough or wrinkled.
 - b. Corolla bilateral, upper lip small and deeply cleft, the lower large and three lobed. 1. *Teucrium*
 - b. Corolla almost regularly five lobed; calyx bell shaped; stamens included. 2. *Isanthus*
- A. Ovary deeply four parted, nutlets basally attached, smooth or granulate. (c)
 - c. Corolla bilabiate, upper lip arched. (d)
 - d. Calyx closed in fruit with a helmet like projections on the upper side. 3. *Scutellaria*
 - d. Calyx usually open in fruit without a projection of the upper side. (e)
 - e. Stamens included in the corolla tube; calyx tubular, five-ten nerved. 4. *Marrubium*
 - e. Stamens exerted from the corolla tube. (f).
 - f. Anther-bearing stamens four. (g).
 - g. Upper pair of stamens longer than the lower. (h).
 - h. Anther sacs parallel or nearly so; stamens divergent. 5. *Agastache*
 - h. Anther sacs divergent.
 - Calyx tubular, five toothed, not two lipped.
 - Plant erect. 6. *Nepeta*
 - Plant decumbent. 7. *Glechoma*
 - Calyx distinctly two lipped. 8. *Dracocephalum*

- g. Upper pair of stamens shorter than the lower pair. (i).
 - i. Calyx distinctly two lipped, closed in fruit.
 - 9. *Prunella*
 - i. Calyx five toothed, not two lipped, open in fruit. (j).
 - j. Calyx membranous, inflated in fruit, faintly nerved.
 - 10. *Physostegia*
 - j. Calyx not membranous, not inflated in fruits, distinctly five-ten nerved. (k).
 - k. Anther sacs transversely two valved.
 - 11. *Galeopsis*
 - k. Anther sacs not transversely two valved, parallel or divergent. (l).
 - l. Nutlets three sided, truncate above.
 - Calyx teeth not awn pointed. 12. *Lamium*
 - Calyx teeth awn pointed, spreading.
 - 13. *Leonurus*
 - l. Nutlets ovoid, rounded above; calyx tubular-bell-shaped, equally five toothed; upper lip of corolla spreading.
 - 14. *Stachys*
- f. Anther-bearing stamens two.
 - Calyx two lipped, anthers with a long connective bearing a perfect cell at the upper end and none or an imperfect cell on the lower end.
 - 15. *Salvia*
 - Calyx tubular and elongated, equally five toothed; anthers of two cells confluent into one, the connective inconspicuous.
 - 16. *Monarda*
 - Calyx ovoid-tubular, two lipped; anthers as in the preceeding.
 - 17. *Blephilia*
- c. Corolla two lipped or regular, upper lip, when present, flat or only slightly concave. (m).
 - m. Corolla more or less two lipped, upper lip erect or spreading, (n).
 - n. Anther-bearing stamens two; calyx swollen on the lower side, hairy in the throat flowers loose.
 - 18. *Hedeoma*
 - n. Anther-bearing stamens four; calyx not swollen on the lower side, hairy in the throat.
 - Calyx fifteen nerved, equally five toothed, stamens exerted.
 - 19. *Hyssopus*
 - Calyx ten-thirteen nerved, ovoid or short tubular, nearly regular five toothed; flowers in dense heads or clusters.
 - 20. *Pycnanthemum*
 - m. Corolla not two lipped, but nearly regular, four of five lobed.
 - Anther-bearing stamens two.
 - 21. *Lycopus*
 - Anther-bearing stamens four.
 - 22. *Mentha*

TAXONOMIC TREATMENT OF THE SPECIES

1. TEUCRIUM (Tourn.) L. Germander

- T. CANADENSE L. Common, especially in or near woods, along river banks, or in any low rich soil.
- T. OCCIDENTALE Gray Common in swampy ground. Under surface of leaves villous white; stem pubescent.
- T. OCCIDENTALE, var. BOREALE (Bickn.) Fern. Stem more closely pubescent than above, with recurved hairs; calyx with few or no capitate glands amongst the ciliate hairs; corolla purplish, 12 to 15 mm. Rare, wet ground. Dickinson Co. near Iowa Lakeside Laboratory.

2. ISANTHUS Michx. False Pennyroyal

- I. BRACHIATUS (L.) B.S.P. Infrequent to common, mostly in the N.W., N.E., & S.E. sections of the state. Dry or sterile soil as railroad grades.

3. SCUTELLARIA L. Skullcap

Leaves sessile or nearly so.

Stems retrorse-pubescent; corolla more than fifteen mm. long; marsh plants.

1. *S. galericulata*

Stems glabrous or sparingly pubescent; corolla less than fifteen mm. long; plants of moist woodlands.

Leaves coarsely crenate.

2. *S. herbosa*

Leaves entire or nearly so.

Pubescence of stem and pedicels spreading; lower surface of leaves dotted with sessile glands.

3. *S. parvula*

Pubescence of stem and pedicels upwardly appressed.

4. *S. Leonardi*

Leaves long petioled.

Flowers less than one cm. long in axillary or terminal racemes.

5. *S. lateriflora*

Leaves cordate, crenate, not conspicuously covered with oil glands beneath; bracts ovate.

6. *S. ovata*

Leaves not cordate; bracts lanceolate or linear; calyx canescent.

7. *S. incana*

- 1. *S. GALERICULATA* L. (*S. epilobifolia* Hamilton). Common in marshes; scattered throughout the north and east portions of the state.
- 2. *S. NERVOSA* Pursh. Smooth, simple, or branched, slender, 1.5 to 5 dm. high; leaves ovate, toothed, 2 to 4.5 cm. long, nerve-like veins prominent beneath; corolla blue, 1 cm. long, lower lip longer than the upper one. Rare moist thickets and rich woods. Jefferson and Jones Co's.
- 3. *S. PARVULA* Michx. Common in dry sandy soil.
- 4. *S. LEONARDI* Epling (*S. parvula* var *ambigua* (Nutt.) Fernald; *S. ambigua* Nutt.). Same as above except the stem is minutely puberulent or glabrous. Frequent in dry soil of woods and prairies. Carrol and Emmet Co's.

5. *S. LATERIFLORA* L. Mad dog skullcap.—Common along streams.
6. *S. OVATA* (*S. versicolor* Nutt.) Frequent along moist banks in the eastern part of the state.
7. *S. INCANA* Spreng. (*S. canescens* Nutt. and *S. incana* Muhl.) Stem branched above, .5 to 1.2 m. high; the paicled, many flowered racemes, flowers, and lower surface of the ovate, lance-ovate, acute crenate leaves whitish with a fine soft down, often rather glabrous. Rare, recorded only from Louisa Co., in the Iowa Herbarium. Woods and river banks.

4. *MARRUBIUM* (Tourn.) L.

- M. *VULGARE* L. Common Horehound. Waste places; frequently escaped from cultivation. Introduced from Europe.

5. *AGASTACHE* Clayton Giant Hyssop

Corolla greenish yellow; stem glabrous or nearly so, stout.

1. *A. nepetoides*

Corolla blue or purple; stem more or less pubescent.

Leaves downy white beneath.

2. *A. Foeniculum*

Leaves glabrous beneath or with few scattered hairs along the veins.

3. *A. scrophulariaefolia*

Leaves pubescent below with long downy hairs.

4. *A. scrophulariaefolia* var. *mollis*

1. *A. NEPETOIDES* (L) Kuntze Common, on hillsides and in the borders of woods.
2. *A. FOENICULUM* (Pursh) Ktze. Stem, smooth; under surface of the leaves glaucous-white with a minute down; foliage with a faint scent of anise. Rare. Prairies and plains. Emmet, Dickinson and Lyon Co's.
3. *A. SCROPHULARIAEFOLIA* (Willd.) Ktze. Very common, hillsides and thickets.
4. *A. SCROPHULARIAEFOLIA* var. *mollis* (Fernald) Heller. Same as above except that the stem and lower surface of the leaves are densely pubescent with long downy hairs. Rare. Decatur, Clayton, Hardin, and Hancock Co's.

6. *NEPETA* L. Cat Mint

- N. *CATARIA* L. Catnip. Very common throughout the state; introduced (Europe).

7. *GLECHOMA* L.

- G. *HEDERACEA*. (L) (Ground Ivy, Gill-over-the-Ground) Frequent throughout the state, common in the eastern part. Low moist or shady places and along streams; spreads rapidly. (Europe)

8. *DRACOCEPHALUM* (Tourn.) L.

- D. *PARVIFLORUM* Nutt. (*Moldavica* Britton) Dragonhead. Infrequent in rocky or gravely calcareous soils, chiefly in recent clearings.

9. PRUNELLA L.

- P. VULGARIS L. Self-heal. Common along roads and streams, and in lawns, especially in sandy loam. Very variable as to size of plant and size of leaves. Also a native of Europe.

10. PHYSOSTEGIA Benth

- P. PARVIFLORA Nutt. (*Dracocephalum Nuttallii* Britton). Smaller False Dragon-head; common near water.
P. VIRGINIANA (L.) Benth. Moist ground; frequently escaped from cultivation. Plant sturdy, very leafy up to the inflorescence; leaves thick, sharply serrate; flowers in a simple or branched spike.

11. GALEOPSIS L. Hemp Nettle

- G. TETRAHIT L. Annual with spreading branches, stem swollen below the nodes; leaves ovate, coarsely serrate; corolla purple, white, or variegated, twice as long as the five-nerved, five-toothed calyx. Infrequent in waste places. Winneshiek and Allamakee Co's. (Europe).

12. LAMIUM L. Dead Nettle

- L. AMPLEXICAULE L. (Henbit) Decumbent herbs; leaves rounded, deeply crenate-toothed, the upper ones clasping; corolla elongated, upper lip bearded, the lower spotted. Infrequent in waste and cultivated places. (Europe).

13. LEONURUS L. Motherwort

- L. CARDIACA L. Common, waste places along roads, fence rows, edges of woods, and along streams (Europe).
L. MARRUBIASTRUM L. Tall biennial, much branched; stem leaves oblong-ovate coarsely toothed; flower clusters very dense, numerous and axillary; corolla light purple to white, its short tube barely exceeding the calyx teeth, the tube naked within. Rare in low moist waste places along ditches near rivers etc. Found in Johnson Co. along the Iowa river near Iowa City. (1942). Introduced. (Europe).

14. STACHYS (Tourn.) L. Hedge Nettle

Stem glabrous on the sides, smooth or bristly on the angles.

Petioles less than one cm. long; stem bristly on the angles.

Leaf blades linear, or lance-linear, narrowed at the base, glabrous or slightly pubescent.

1. *S. aspera*

Leaf blades entirely glabrous or thinly hispid with stiff hairs only; calyx glabrous or hirsute; leaves usually crenate dentate, 1.5 to 4.5 cm. wide.

2. *S. hispida*

Petioles one to two cm. long; stem usually wholly glabrous.

3. *S. tenuifolia*

Stem more or less pubescent on the sides as well as the angles.

Leaves linear to linear-lanceolate, crenulate, densely pubescent on both faces.

4. *S. arenicola*

Leaves lanceolate to ovate-cordate.

Leaves lanceolate, acute, usually more than two cm. broad, sides narrowed below the middle. 5. *S. palustris* var. *homotricha*.

Leaves lanceolate, usually less than 2.5 cm. broad, sides parallel below the middle. 6. *S. palustris*

Leaves ovate to ovate-lanceolate, short, acuminate; hairs on upper surface and veins beneath with pustulate bases; corolla about twelve mm. long. Swamps. 7. *S. Schweinitzii*

1. *S. ASPERA* Michx. (*S. hyssopifolia* var. *ambigua* Gray, *S. ambigua* Britton). Stem erect, branched; leaf blades oblong to linear-lanceolate, serrate, short petioled, calyx teeth lanceolate, subulate tipped, ciliate; corolla light purple, upper lip pubescent on the back. Rare; low ground in the southeastern part of the state.
2. *S. HISPIDA* Pursh. (*S. tenuifolia* var. *aspera* (Michx.) Fern. and *S. aspera* of authors not Michx.) Frequent in low ground.
3. *S. TENUIFOLIA* Willd. Frequent in eastern Iowa and infrequent throughout the rest of the state. Moist ground.
4. *S. ARENICOLA* Britton. Infrequent in the southeast and other localized places over the state. Sandy soil.
5. *S. PALUSTRIS* var. *HOMOTRICHIA* (L.) Fern. Frequent throughout the state, wet places.
6. *S. PALUSTRIS* L. Common, wet ground.
7. *S. SCHWEINITZII* Rydb. Frequent in swamps. Similiar to *S. PALUSTRIS* var. *HOMOTRICHIA* except that the calyx and corolla are larger and the hairs on the leaves have pustulate bases, especially those on the veins beneath.

15. *SALVIA* (Tourn.) L. Sage

Leaf blades crenulate, ovate, lance-ovate to lanceolate or oblong; upper lip of the calyx three-toothed; corolla about one cm. long.

1. *S. sylvestris*

Leaf blades entire or with a wavy margin; upper lip of calyx entire; corolla tube short, included in the calyx.

2. *S. lanceolata*

Leaf blades minutely dentate or serrate, short petioled, upper often linear, entire; calyx teeth short, upper lip entire; corolla white or blue, 1.5 to 2.5 cm. long, with a prominently exerted tube.

3. *S. azurea* var. *grandiflora*.

1. *S. SYLVESTRIS* L. Stem densely puberulent, branched; lower leaves petioled, blades oblong, subcordate at the base, the upper ones sessile, ovate or lanceolate; upper lip of the calyx three-toothed, lower two-cleft; corolla violet-blue. Rare. Dickinson and Potawattamie Co's.
2. *S. LANCEOLATA* Willd. (*S. lanceaefolia* Auth. no Poir.) Infrequent, plains and open soil mostly in the southwest part of the state.
3. *S. AZUREA* var. *GRANDIFLORA* Benth. Stem ash colored, puberulent; lower leaves lanceolate or oblong, obtuse, denticulate or serrate, tapering to a short petiole, upper narrower, often linear, entire; inflorescence spike like; calyx teeth short, the broad upper lip entire; corolla blue or white. Rare. Dickinson Co.

16. MONARDA L. Horse Mint

Flower clusters solitary at the ends of the stem and branches, anthers exerted.

Calyx not hairy in the throat; corolla bright red. 1. *M. didyma*

Clayx hairy in the throat; corolla purple, pink or white.

Stem pubescence of spreading hairs or none; leaves villous.

2. *M. fistulosa*

Stem pubescence not at all spreading; leaves canescent.

3. *M. mollis*

Flower clusters terminal and in the axils of the leaves; stamens not at all exerted; calyx lobes triangular; corolla yellowish with purple dots.

4. *M. punctata*

1. *M. DIDYMA* L. (Oswego Tea, Bee Balm)

Stem somewhat hairy; leaves ovate, lanceolate, acuminate, the floral ones and the large outer bracts tinged with red; corolla smooth, four to five cm. long, bright red. Rare, moist woods and along streams.

2. *M. FISTULOSA* L. Frequent, dry hills and thickets.

3. *M. MOLLIS* L. Very common. Prairies and among bushes.

4. *M. PUNCTATA* L. Frequent in the eastern part of the state in sandy soil.

17. BLEPHILIA Raf.

B. *CILIATE* (L.) Raf. Stem somewhat downy; leaves almost sessile, whitish-downy beneath; outer bracts ovate, acute, colored, ciliate, as long as the calyx; corolla hairy. Infrequent, dry open places in the south eastern part of the state.

B. *HIRSUTA* (Pursh.) Benth. Taller than above; leaves long petioled; corolla pale with darker purple spots. Frequent, especially in the eastern part of the state. Moist shady places.

18. HEDEOMA Pers. Mock Pennyroyal

H. *PULEGIOIDES* (L.) Pers.. Frequent in the southeastern part of state. Also in Page, Madison, Green, Calhoun and Fayette Co's.

H. *HISPIDA* Pursh. Common, especially in dry ground.

19. HYSSOPUS (Tourn.) L. Hyssop

H. *OFFICINALIS* L. Rare; roadsides, sparingly escaped from cultivation. Calhoun Co. (Europe.)

20. PYCNANTHEMUM Mich. Mountain Mint

Leaves lanceolate to ovate-lanceolate, acute at base, short petioled, pubescent and dull; stem pubescent, calyx teeth villous pubescent, canescent; stamens exerted.

Leaves linear to linear-lanceolate, sessile or nearly so.

Stem glabrous, much branched; calyx teeth with short firm points.

2. *P. flexuosum*

Stem minutely pubescent, especially at the angles, or smooth; calyx teeth short and triangular.

3. *P. virginianum*

1. *P. PILOSUM* Nutt. (*P. muticum* var. Gray) Frequent in the eastern part of the state, infrequent elsewhere; prairies and dry woods.
2. *P. FLEXUOSUM* (Walt.) B. S. P. Common in dry ground, pastures.
3. *P. VIRGINIANUM* (L.) Durand and Jackson. Common, low open woods, roadside banks and moist sandy prairies.

21. *LYCOPUS* (Tourn.) L. Water Horehound

Leaves more or less serrate.

Calyx lobes ovate to lanceolate or deltoid, slightly acute or blunt at the apex, shorter than the mature nutlets.

Roots of young plant not tuberous; leaves ovate or ovate-oblong, acuminate at both ends, coarsely toothed, short petioled; calyx ovoid-cylindric; corolla nearly twice as long as the calyx; stamens included.

1. *L. virginicus*

Roots of young plant tuberous; leaves lanceolate to oblong-lanceolate, sharply serrate, sessile; calyx campanulate, gradually narrowing at each end; corolla two or three mm. long with flaring tubes; stamens exerted.

2. *L. uniflorus*

Calyx lobes lanceolate or subulate, very acute, longer than the mature nutlets.

Corolla twice as long as the calyx; bracts minute; leaves ovate-oblong, sharply serrate in the middle, attenuate-acuminate at both ends; petioled.

3. *L. rubellus*

Corolla hardly exceeding the calyx; outer bracts conspicuous; leaves lanceolate or oblong-lanceolate, very sharply and coarsely serrate, sessile or nearly so.

4. *L. asper*

Leaves pinnatifid or deeply incised.

5. *L. americanus*

1. *L. VIRGINICUS* L. Common in marshes.
2. *L. UNIFLORUS* Michx. Infrequent. Low ground.
3. *L. RUBELLUS* Moench. Frequent in low ground. The Iowa herbarium has specimens only from Linn Co.
4. *L. ASPERA* Greene (*L. lucidus Americanus* Gray). Infrequent, wet places.
5. *L. AMERICANUS* Muhl. (*L. sinuatus* Ell.) Very common in low ground.

22. *MENTHA* (Tourn.) L. Mint

Whorls of flowers in terminal spikes or some in the axils of the upper leaves.

Spikes narrow and leafless, mostly interrupted; leaves sessile or nearly so.

1. *M. spicata*

Spikes thick, mostly dense; leaves more or less petioled.

Leaves lanceolate, narrowed at base; calyx teeth hirsute.

2. *M. piperita*

Leaves ovate, rounded at the base;

Calyx hairy.

3. *M. aquaticu*

Calyx glabrous.

4. *M. citrata*

Whorls of flowers all axillary.

Stem glabrous or nearly so.

5. *M. gentilis*

Stem more or less pubescent.

6. *M. arvensis* var *canadensis*

1. *M. SPICATA* L. Spearmint. Infrequent as an escape (Europe).

2. *M. PIPERITA* L. Peppermint Rare as an escape.

Muscatine Co. and (Decatur Co. Cratty). (Europe).

3. *M. AQUATICA* L. Water Mint Pubescent with recurved hairs; leaves ovate or round ovate; flowers in a terminal globular or interrupted and ellipsoid head, often with one or more clusters in the axils of the upper leaves; calyx and pedicels hairy. Wet places. Rare. Johnson Co. (Europe).

4. *M. CITRATA* Ehr. Glabrous or glabrate; leaves slender-petioled, ovate-sharply serrate; flowers in terminal or upper axillary clusters; corolla pink or white. Rare. Low moist ground. Johnson Co. (Europe).

5. *M. GENTILIS* L. Frequent as an introduced plant. (Europe).

6. *M. ARVENSIS* var. *CANADENSIS* (L.) Briquet. Wild Peppermint Very common especially in rich damp soil as borders of prairie marshes and river banks.

STATE UNIVERSITY OF IOWA

IOWA CITY, IOWA

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